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Standard No. S24.804
January 22, 1973
(Revised 08/04/87)

GENERAL REQUIREMENTS FOR TRAINING ON ELECTRONIC EQUIPMENT

1.0 SCOPE

1.1 Purpose. This document establishes requirements for the content and conduct of contractor training courses in the operation and maintenance of electronic, electrical, and electro-mechanical equipment system.

1.2 Application. The requirements of this standard shall apply to equipment or systems developed or fabricated to Government specifications. Unless otherwise specified, they shall not apply to commercial production items unless such items form an integral part of equipment or systems developed or fabricated to Government specifications.

1.3 Contracting Officer's Technical Representative. The Contracting Officer's Technical Representative (COTR) shall provide the final interpretation of any conflict between this standard and specific contract requirements.

1.4 Waivers. Any request for waiver of specific requirements of this standard shall be submitted in writing to the COTR and to the Contracting Officer. A request for waiver must include: a) identification of the paragraphs for which the waiver is requested; b) identification of the systems, equipment, or components for which the waiver is requested; and c) a discussion of rationale for granting the waiver, including impact on reliability, maintainability, schedule, and cost if the waiver is not granted.

2.0 APPLICABLE DOCUMENTS

NOAA/NESDIS Standard No. S24.801
"Preparation of Operation and Maintenance Manuals"

NOAA standards are available from: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Environmental Satellite, Data, and Information Service, OSD/3, Washington, D.C. 20233.

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2.1 DEFINITIONS

2.1.1 Course or Session. A class or series of classes tailored to a particular audience, or topic (e.g., operators, maintenance, hardware, or software).

2.1.2 Class, meeting, or period. A time block of training emphasizing a specific topic, and generally **preceeded** and followed by a break.

3.0 CONTENT

3.1 General. The training shall provide the information and skills necessary to operate and maintain the installed equipment, hardware and software. Operator training shall be provided separately from maintenance training. As a minimum, the following areas **shall** be covered in each course:

- (a) Equipment purpose and capability
- (b) Equipment theory and principles of operation
- (c) Equipment layout and interconnection
- (d) Operating procedures
- (e) Alignment, calibration, preventive maintenance, and troubleshooting techniques
- (f) Use of manuals and drawings
- (g) Equipment software

3.2 Technical level. Training shall be presented from the viewpoint of a technician having a good general background of education and experience. The sessions shall provide thorough equipment discussion on both the block diagram and circuit level. Elementary theory shall be included to the extent necessary to explain unusual circuits and circuit arrangements, and devices new or recent in the state-of-the-art. The discussion shall be in specific quantitative terms. Use of mathematics on a design engineering level shall be avoided wherever possible. Thorough training in the use of any special tools and/or auxiliary equipment used in operation, alignment, or repair shall be included.

3.3 Format. The training shall be divided between formal classroom and laboratory instruction. Training shall be keyed to the Operation and Maintenance Manuals for the systems. The laboratory instruction shall utilize the installed and accepted equipment to the fullest extent practicable. The final training meeting of a session shall provide sufficient time (about 5% of the total course duration) for review, general discussion, and critique

of the course material.

4.0 ARRANGEMENTS

4.1 Location. All training shall be conducted at the specified location and with the system, or representative equipment, present and operational. This location is normally the site where the equipment is ultimately installed, though training may be required at alternate or multiple locations. The contractor shall bear facilities costs associated with training conducted at non-Government owned/operated locations.

4.2 Time. Training shall not exceed 8-hours per day, combined classroom and laboratory time. Training shall normally begin and be completed within sixty days after installation and acceptance of the equipment. Training will be conducted during the normal work week (Monday-Friday), and during normal working hours (7 a.m. - 6 p.m.). Saturday or evening periods may be scheduled for special purposes, but only with the concurrence and approval of the COTR. Breaks, of 10-15 minutes duration shall be provided at least every 1 to 2 hours throughout a training session.

4.3 Duration. The training period shall extend for at least the time specified in the applicable equipment specification or work statement. Equipment size and complexity strongly determine the duration of a given training session.

4.4 Attendance. Class size shall not exceed 15 trainees. The contractor shall supply courses and training materials for the number of attendees specified in the applicable equipment specification or statement of work. However, the Government reserves the right to have additional personnel attend training classes, if facilities permit.

5.0 MATERIALS AND FACILITIES

5.1 Contractor items. The contractor shall furnish the following items:

- (a) Location information;
- (b) Lesson schedule and plans;
- (c) Preliminary operation and maintenance manuals;
- (d) Training aids.

5.1.1 Location information. At least **90-days** prior to the beginning of the course the contractor shall submit to the COTR a location information package for review and approval. The package

shall include the following information for those attending the course:

- (a) Course coordinator
(company name, address, telephone number).
- (b) Location (name, address, and telephone number
for contact or messages during the course).
- (c) Location map, identifying routes from major highways,
airports, and rail and bus terminals.
- (d) Motel/hotels, at least five (5) within a fixed radius
of the training location, including name, address, and
telephone number.
- (e) Area restaurants, with brief description of bill-of-
fair, hours of operation, meals served (BLD), and
name and address.

5.1.2 Lesson schedules and plans. At least sixty days prior to beginning of the course the contractor shall submit to the COTR, for review and approval, a copy of the lesson schedule and course outline. The schedule shall indicate in detail the areas of training to be covered, giving day, time, subject of each session, and instructor's name.

5.1.3 Preliminary manuals. Preliminary copies of the operation and maintenance manual shall be provided as the course text. Corrections generated during the training period shall be incorporated in the final manual.

5.1.4 Training aids. As a minimum, training aids shall consist of transparencies, suitable for projection of material for classroom presentation. Included shall be the following types of material:

- (a) Pictorial layouts
- (b) Schematic diagrams
- (c) Block diagrams
- (d) Logic diagrams
- (e) Interconnection diagrams

All training materials shall become the property of the Government upon completion of the training program.

5.1.5 Lesson Schedules. Location information, lesson schedules and plans, preliminary manuals, and copies of training aids, shall be provided to the official attendees and the COTR at least two weeks in advance of the training session.

5.2 Instructors. The contractor shall provide a qualified instructor (or instructors) to conduct the training course. The instructor shall preferably be an engineer involved in the design and production of the equipment. For large systems different instructors may be employed for various aspects of the system. A summary of the instructors qualifications, as they apply to the course, shall be supplied to the COTR in advance of the training session. **An** instructor may be used in **a** course only with the approval of the COTR. The contractor shall provide for all the expenses (travel, salary, and per diem) of course instructors.

5.3 Government facilities. For training conducted at Government locations, the following items will be provided to the contractor:

- (a) Classroom
- (b) Chalkboards
- (c) Flip-chart easels
- (d) Overhead projector
- (e) 35mm slide projector
- (f) Projection screen.

In addition, the following items may be available, and if available, will be provided to the contractor:

- (g) 16mm sound film projector
- (h) Closed circuit television with record/playback capability and monitor (reel-to-reel, or VHS format).

5.4 Contractor facilities. For training conducted at contractor locations (owned, operated, contracted, rented, or leased) the follow items shall be provided by the contractor:

- (a) Classroom
- (b) Chalkboards
- (c) Flip-chart easels
- (d) Overhead projector
- (e) 35mm slide projector
- (f) Projection screen
- (g) Refreshment facilities (ice water, coffee, tea, soft drinks, and snacks) for use during course breaks.

In addition, the following items shall be provided by the

contractor, if required by the prepared training aids:

(h) 16mm sound film projector

(i) Closed circuit television with record/playback capability and monitor (reel-to-reel, or VHS format).